

# Notice of Allowability

Application No.

09/995,616

Examiner

Juan D Valentin II

Applicant(s)

KIKUCHI ET AL.

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 04/20/2004.
2. ☒ The allowed claim(s) is/are 1-6, 9-17, 21 and 22.
3. ☒ The drawings filed on 29 November 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## DETAILED ACTION

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR

1.312. To ensure consideration of such an amendment, it ~~MUST~~ be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Sean M. McGinn (reg. Num. 34,386) on May 5<sup>th</sup>, 2004.

The application has been amended as follows:

- Please cancel claims 7, 8, 18, 19, & 20.
- Please replace claim 1 with the following:

1. An optical waveguide path coupling structure where a first optical waveguide path including a first core layer and a second optical waveguide path including a second core layer are optically coupled, wherein;

said first optical waveguide path arranged on an optical device chip, which has a first cross section formed such that said first core layer is exposed as an oblique plane with a slight angle at an end portion and a second cross section formed in an approximately vertical direction to said first cross section at a position apart from said first cross section by a predetermined distance, and a second optical waveguide path arranged on a base substrate, which has a third cross section formed such that said second core layer is exposed as an oblique plane with a slight angle at an end portion and a fourth cross section formed in the approximately vertical direction

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to said third cross section at a position apart from said third cross section by a predetermined distance, are coupled by aligning said first and third cross sections and said second and fourth cross sections.

- Please replace claim 22 with the following:

22. A coupling method of an optical waveguide path that couples a first optical waveguide path comprising a first film with a lower clad layer, a core layer, a thin film upper clad layer, and a side clad layer having approximately a same height as the core layer, and a second optical waveguide path comprising a second film with a similar configuration as the first film, wherein;

said first film is provided on an optical device chip and made to be a specular surface having a slope of approximately 45 degrees on an upper portion of a light-emitting surface or a light-receiving surface of said optical device chip,

core layers for alignment used as a pattern for alignment are formed on positions corresponding with each other on said first film and said second film other than said core layer, a first cross section with a slight angle to an optical path direction is formed at an end portion side of each of said core layers for said alignment to expose said core layers for said alignment, and a second cross section formed having a predetermined cross angle with each of said first cross sections to expose an end surface of each of said core layers, and

said first cross section and said second cross section of said second optical waveguide path are put against said first cross section and said second cross section of said first optical waveguide path, and said thin film upper clad layer of said first optical waveguide path and said core layer of said second optical waveguide path are made to contact in a thickness direction.

*Allowable Subject Matter*

2. The following is an examiner's statement of reasons for allowance:

3. Claims 1-6, 9-17, 21, & 22 are allowed over prior art of record.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 1, the prior art fails to disclose or make obvious "a second optical waveguide path arranged on a base substrate, which has a third cross section formed such that said second core layer is exposed as an oblique plane with a slight angle at an end portion and a fourth cross section formed in the approximately vertical direction to said third cross section at a position apart from said third cross section by a predetermined distance, are coupled by aligning said first and third cross sections and said second and fourth cross sections" and in combination with the other recited limitations of claim 1.

Regarding claim 2, the prior art fails to disclose or make obvious "a first cross section is formed with a slight angle in an optical path direction at an end portion side of said core layer on said film to expose said core layer, and a second cross section is formed having a predetermined cross angle with said first cross section" and in combination with the other recited limitations of claim 2. Claims 3 & 4 are allowed by virtue of dependency on the allowed claim 2.

Regarding claim 5, the prior art fails to disclose or make obvious "said core layer for alignment used as a pattern for alignment is formed on said film other than said core layer and a first cross section is formed with a slight angle to an optical path direction at an end portion side of said core layer for said alignment to expose said core layer for said alignment, and a second cross section is formed having a predetermined cross angle with said first cross section to expose

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an end surface of said core layer” and in combination with the other recited limitations of claim 5.

Regarding claim 6, the prior art fails to disclose or make obvious “forming a second cross section with a predetermined angle said film at a position apart from said optical path direction of from said position of said core layer by a predetermined distance” and in combination with the other recited limitations of claim 6.

Regarding claim 9, the prior art fails to disclose or make obvious “a first cross section with a slight angle to an optical path direction is formed at an end portion side of said core layer of said film to expose said core layer” and in combination with the other recited limitations of claim 9. Claims 10-16 are allowed by virtue of dependency on the allowed claim 9.

Regarding claim 17, the prior art fails to disclose or make obvious “a core layer for alignment used as a pattern for alignment is formed on said film other than said core layer and a first cross section with a slight angle to an optical path direction is formed at an end portion side of said core layer for said alignment to expose said core layer for said alignment, and a second cross section is formed having a predetermined cross angle with said first cross section to expose an end surface of said core layer” and in combination with the other recited limitations of claim 17.

Regarding claim 21, the prior art fails to disclose or make obvious “a first cross section with a slight angle to an optical path direction is formed at an end portion side of each of said core layers to expose said core layer on said first and second films and a second cross section is formed having a predetermined cross angle with said first cross section” and in combination with the other recited limitations of claim 21.

Regarding claim 22, the prior art fails to disclose or make obvious "core layers for alignment used as a pattern for alignment are formed on positions corresponding with each other on said first film and said second film other than said core layer, a first cross section with a slight angle to an optical path direction is formed at an end portion side of each of said core layers for said alignment to expose said core layers for said alignment, and a second cross section formed having a predetermined cross angle with each of said first cross sections to expose an end surface of each of said core layers" and in combination with the other recited limitations of claim 22.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan D Valentin II whose telephone number is (571) 272-2433. The examiner can normally be reached on M-Th., Every other Fr..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Juan D Valentin II

Examiner 2877

JDV

May 10, 2004



Michael P. Staffira

Primary Patent Examiner

Technology Center 2800